

Serial No. 09/765,014
Amendment dated January 18, 2006
Reply to Office action of October 18, 2005

Amendments to the Drawings:

The attached replacement drawing, FIG. 5, is amended to replace reference number 111 with reference number 215.

Serial No. 09/765,014
Amendment dated January 18, 2006
Reply to Office action of October 18, 2005

REMARKS

On page 2 of the Office Action mailed on October 18, 2005, the replacement Fig. 5 submitted with the Amendment mailed on March 29, 2005 was disapproved. A new replacement Fig. 5 is submitted herewith changing the reference number 111 to 215 as suggested by the Examiner. The replacement Fig. 6 submitted with said Amendment was also disapproved because the reference number 631, mentioned on page 13, line 11 of the specification, is not in Fig. 6. Page 13 of the specification is amended herewith to change said reference number 631 to 731, which is shown in Fig. 7.

On page 3 of the Office Action, claims 1 and 49 were objected to for various informalities. Claims 1 and 49 are amended herewith to overcome these objections.

On page 4 of the Office Action, claims 1, 4, 6-9, 11, 12, 15, 18-20, 22-24, 26-28, 30, 32, 35, 37, 38, 40, 42, 44, 46, 48-50, 52-55, 57, 59, 61, 63, 65, 68, 70, 71, 73, 75 and 77-80 were rejected under 35 U.S.C. 103(a) as being unpatentable over Ling et al (International Application WO 98/39871) in view of any/all of Ungerboeck ("Channel Coding with Multilevel/phase Signals"), Lee (*Convolutional Coding: Fundamentals and Applications*), and Schlegl (*Trellis Decoding*), and further in view of Uyematsu et al. ("Trellis Coded Modulation for Multilevel Photon Communication Systems"). Regarding claim 1, the Examiner goes to great lengths to argue that Ling, when read in the light of the Ungerboeck, Lee and Schlegl references, appears to teach a trellis coded modulation (TCM) scheme. The Examiner then goes on to argue that it would have been obvious to a person of ordinary skill in the art to apply the alleged trellis coding method of Ling to an *optical* system to transmit the analog multilevel signals over an *optical* channel. Even assuming, for the sake of argument, that Ling teaches a trellis coded modulation scheme, and further assuming, for the sake of argument, that it would have been obvious to a person of ordinary skill in the art to apply the alleged trellis coding method of Ling to an *optical* system to transmit the analog multilevel signals over an *optical* channel, it does not follow that it would have been obvious to apply Ling's equalization on the transmit side to an optical communication system. Thus Applicant submits that the cited combination of Ling, Ungerboeck/Lee/Schlegl, and Uyematsu does not teach nor suggest "equalizing the digital multilevel symbols to compensate for characteristics of (an) optical channel," as claimed in claim 1. Indeed, the Examiner does not directly assert that it would have been obvious to apply Ling's equalization on the transmit side to an optical communication

Serial No. 09/765,014
Amendment dated January 18, 2006
Reply to Office action of October 18, 2005

system, but rather only asserts that it would have been obvious to apply Ling's alleged TCM scheme to an optical communication system. Furthermore, the Examiner does not provide any motivation to apply Ling's equalization on the transmit side to an optical communication system. Applicant submits that there is no suggestion to combine the equalization on the transmit side of Ling with Uyematsu's trellis coding for optical systems. "To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references."¹ Applicant submits that there is no suggestion in either Ling or Uyematsu (nor in Ungerboeck, Lee or Schlegl) to apply Ling's equalization on the transmit side to an optical system. Therefore, Applicant submits that claim 1, and claims 4-9 depending therefrom, are not obvious in view of Ling, Ungerboeck/Lee/Schlegl and Uyematsu.

Independent claims 11, 28, 32, 38, 42, 57, 61, 65 and 71 contain limitations similar to limitations included in claim 1 and was rejected under similar reasoning to the rejection of claim 1. Applicant submits that claims 11, 28, 32, 38, 42, 57, 61, 65 and 71, and all claims depending therefrom, are not obvious in view of Ling, Ungerboeck/Lee/Schlegl and Uyematsu, for the reasons set forth above with respect to claim 1.

Independent claims 24, 46, 50 and 75 were also rejected under 35 U.S.C. 103(a) as being unpatentable over Ling in view of any/all of Ungerboeck, Lee and Schlegl, and further in view of Uyematsu. Claims 24, 46, 50 and 75 involve performing equalization at the receive end of an optical communication system that utilizes multilevel signals and/or trellis coded signals. The Examiner went into little detail regarding the rejection of these claims, other than to assert that the combination of Ling, Ungerboeck/Lee/Schlegl and Uyematsu teaches the claims. Applicant assumes that in rejecting these claims, the Examiner employed a similar rationale as that used in rejecting claim 1. In any event, Applicant submits that it would not have been obvious for one of ordinary skill in the art to apply Ling's equalization on the receive side to an optical communication system that utilizes multilevel signals and/or trellis coded signals. Thus Applicant submits that the cited combination of Ling, Ungerboeck/Lee/Schlegl, and Uyematsu does not teach nor suggest performing equalization at the receive end of an optical communication system that utilizes

¹ *Ex Parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985).

Serial No. 09/765,014
Amendment dated January 18, 2006
Reply to Office action of October 18, 2005

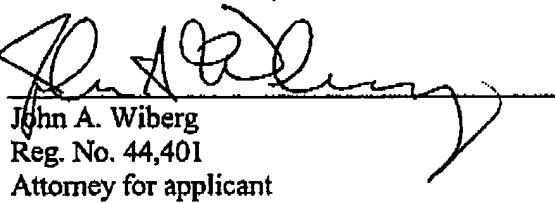
multilevel signals and/or trellis coded signals, as claimed in claims 24, 46, 50 and 75. Indeed, the Examiner does not directly assert that it would have been obvious to apply Ling's equalization on the receive side to an optical communication system. Furthermore, the Examiner does not provide any motivation to apply Ling's equalization on the receive side to an optical communication system. Applicant submits that there is no suggestion to combine the equalization on the receive side of Ling with Uyematsu's trellis coding for optical systems. "To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references."² Applicant submits that there is no suggestion in either Ling or Uyematsu (nor in Ungerboeck, Lee or Schlegl) to apply Ling's equalization on the receive side to an optical system. Therefore, Applicant submits that claims 24, 46, 50 and 75, and all claims depending therefrom, are not obvious in view of Ling, Ungerboeck/Lee/Schlegl and Uyematsu.

In view of the foregoing, Applicant respectfully requests reconsideration and allowance of claims 1, 4-9, 11, 12, 15, 16, 18-20, 22-24, 26-28, 30-32, 35-38, 40-42, 44-46, 48-50, 52-55, 57, 59-61, 63-65, 68-71, 73-75 and 77-80.

The Commissioner is hereby authorized to charge additional fee(s) or credit overpayment(s) to the deposit account of McAndrews, Held & Malloy, Account No. 13-0017.

Date: January 18, 2006

Respectfully submitted,


John A. Wiberg
Reg. No. 44,401
Attorney for applicant

McANDREWS, HELD & MALLOY, LTD.
500 West Madison Street, Suite 3400
Chicago, Illinois 60661
Telephone: (312) 775-8000

² *Ex Parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985).